Looking for a Pet

Reporting Category   Probability and Statistics

Topic   Predicting the likelihood of outcomes

Primary SOL   4.13   The student will
  a) predict the likelihood of an outcome of a simple event; and
  b) represent probability as a number between 0 and 1, inclusive.

Materials

- Five-section spinner showing numbers 1–5
- Poster displaying 3 dogs and 2 cats numbered 1–5
- Chart paper
- Markers

Vocabulary

possible outcome, event, predict, probability, impossible, unlikely, equally likely, likely, certain, fraction, least likely, most likely

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Present the following scenario to the class: "Sarah and her parents have decided that it is time for her to have a pet. After a lot of discussion, they agree to go to the city pound to 'adopt' a pet. When they arrive at the pound, the supervisor tells them that the pound has 5 animals. The animals include both cats and dogs. All of the animals are so cute and need homes, so it's very hard for Sarah to make a decision. She really wants them all and cannot choose between them, but her parents tell her that 5 are too many, and she will have to choose one. To help her choose which animal to adopt, the supervisor assigns a number from 1 to 5 to each of the animals. He then shows Sarah and her parents a spinner that has the numbers 1 through 5 on it. They decide that Sarah will spin the spinner 12 times and tally the number of times the spinner falls on each number. The number with the most tally marks will identify the animal Sarah will take home as her new pet!"

2. Tell the students that each of them is going to do what Sarah did—i.e., use a spinner to decide which animal to take home. Display the poster showing 3 dogs and 2 cats with their assigned numbers 1–5. Distribute spinners, and direct each student to spin his/her spinner 12 times and tally each number as the spinner points to it.

3. Survey the class to determine which animal each student has selected by spinning. Display the results in a chart format by writing the numbers 1 to 5 on chart paper and placing a tally mark beside each number to show how many students selected it. Discuss the results. Was one number selected more than others? Did each number have an equal chance of being selected? Why, or why not?

4. Instruct each student to write his/her tallies as fractions. For example, for the hypothetical results, #1 = $\frac{2}{12}$, #2 = $\frac{4}{12}$, #3 = $\frac{2}{12}$, #4 = $\frac{1}{12}$, #5 = $\frac{3}{12}$, Sarah found that number 2 received the most tally marks, and she took home a little cat because it had the number 2 assigned to it.

Assessment
- **Questions**
  - o Was this a fair way to make this choice? Why, or why not? Would it be a fair way to make any choice? Why, or why not?
  - o If Sarah had repeated the spinning process, would the spinner have chosen the same animal the second time? Why, or why not? In what other situations might this kind of decision making be used? Is this a reasonable method to make a decision?
- **Journal/Writing Prompts**
  - o Write about a choice you had to make. Did you use a method similar to Sarah's, or did you use another method? Explain what you did and why.
  - o When playing a game, explain how you decide who goes first. Explain why this is a fair way to make that decision.
- **Other**
  - o Observe students as they use the spinners and record their tallies. Be careful to note whether they record their fractions correctly. Ask individual students to explain why the denominator of each fraction is 12.

Extensions and Connections (for all students)
- Have students place four different-color cubes in a bag, draw one cube from the bag, tally the color, replace it, and continue until 12 draws have been tallied. Then, have them repeat the trial and compare the results of the two trials.
- Have the students roll a die and record whether the number is odd or even. Then, have them continue until 12 rolls have been tallied. Discuss whether or not there is a better chance of rolling an even number than an odd number, and why.
- Have the students construct four-section spinners with only three colors listed, thus giving one color a better chance than the others. Have them spin the spinner 12 times and record the colors, using tally marks. Discuss whether or not the color listed in two of the four sections was selected more than each of the other colors, and why.
- Have the students spin an eight-number spinner 12 times and tally each spin. Discuss whether or not each number had an equal chance of the spinner landing on it, and why.
- Have students construct a spinner on which all colors are equally likely to be spun.

Strategies for Differentiation
- Provide students with five blocks, each with a different animal pictured on it, and a bag. Ask students to draw one block from the bag and replace it 12 times instead of using a spinner.
- Have students use probability software programs to practice their ability to read and write probability statements.
- Have students use a word processing program to complete steps 2 and 3.
- Have students act as the spinners by placing stuffed animals representing Mary's choices in a large circle on the floor and having students take turns spinning (with eyes closed) in the center of the circle and facing an animal when stopped. You might also spin students in a chair (not too fast!).
- Invite a representative from an animal shelter to visit the class to discuss the different ways people select pets.